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Physiological Basis of Rehabilitation for Ulnar Neuritis

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There are a large number of factors that contribute to the emergence of neuritis of the ulnar nerve. These include the presence in the body of the causative agent of infectious diseases, hypothermia, the occurrence of bruises or fractures, poisoning with mercury, arsenic or alcohol, the presence of diseases of internal organs, a deficiency of vitamins or minerals in the body. The main symptom of neuritis is a pain syndrome, which is localized in the elbow joint, tingling, aching, dull in nature, often paroxysmal. Disclosure of the theoretical aspects of the physical rehabilitation of patients with ulnar nerve damage has been the subject of many works, but so far there are no clear views on the technique for correcting this neuropathy. Unfortunately, the most often recommended complexes of physical rehabilitation for peripheral neuropathies are not always effective in terms of restoring the function of the ulnar nerve. Used standard sets of exercises for the hand and fingers are often not effective in these patients. In addition to medical physical culture, it is recommended to use occupational therapy during rehabilitation for ulnar neuritis. It is very effective in the rehabilitation of patients with pathology of the upper extremities as a result of the fact that it is associated with the performance of certain labor operations aimed at restoring the function of the damaged radial nerve. With neuritis of the ulnar nerve, mechanotherapy is also very effective, which reduces joint stiffness, eliminates swelling of tissues, and improves the reparative regeneration of damaged structures. Physiotherapy also proved to be a very effective way to eliminate ulnar neuritis. With the correct and timely diagnosis, it is possible to begin rehabilitation earlier for ulnar neuritis, which very often provides a favorable outcome. However, physical rehabilitation does not always contribute to a complete recovery.

Keywords: Neuritis; Rehabilitation; Restoration of Functions; Recovery; Treatment; Upper Limb; Ulnar Nerve.

In modern society, various disorders of the functioning of organs and tissues remain very common[1]. Often the basis of these lesions are dysfunctions of the innervation processes[2], associated with injuries in everyday life, in transport or in production[3]. In most cases, in

peacetime, the nerves of the upper extremities are mechanically injured and only a small percentage falls on the nerves of the legs[4].

The clinical picture of neuritis is composed of disorders of sensitivity (pain, temperature, tactile), motor and vegetotrophic disorders. Movement disorders in neuritis are manifested in the development of paresis or paralysis. Peripheral paralysis is flaccid. They are accompanied by muscle atrophy, a decrease or disappearance of tendon reflexes, a decrease in muscle tone, trophic changes, disorders of skin sensitivity, pain when stretching muscles. Damage to nerve trunks is often accompanied by impaired motor function, which manifests itself in the cessation or weakening of voluntary muscle contractions innervated by the muscle branches extending below the level of damage[5]. When nerves are damaged, a violation of the motor functions of the limbs is accompanied by a decrease or loss of muscle tone. This is accompanied by a decrease in the ability to do fine work and differentiated movements[6].

The objectives of a comprehensive rehabilitation treatment for peripheral nerve neuritis are: stimulation of regeneration of nerve portions in a state of oppression, improvement of blood supply and trophic processes in the lesion in order to prevent the formation of adhesions and cicatricial changes, strengthening paretny muscles and ligaments; prevention of contractures and stiffness of the joint, restoration of disability by normalizing motor functions and the development of compensatory devices. The methodology and nature of rehabilitation measures is determined by the volume of motor disorders, their localization and stage of the disease. Of great medical and social importance are the periods of temporary disability caused by damage to the nerve trunks and the adequacy of the rehabilitation treatment. Despite the disclosure of many theoretical aspects of the physical rehabilitation of patients with ulnar nerve damage, there are still no clear views on the technique for correcting this neuropathy[7]. Recommended complexes of physical rehabilitation for peripheral neuropathies are not always effective, especially in terms of restoring the function of the ulnar nerve. Used standard sets of exercises for the hand and fingers are also very often not effective in these patients. In this regard, the goal was set: to consider the basics of physiologically justified methods of physical rehabilitation for neuritis of the ulnar nerve, taking into account their effectiveness.

Pathogenesis and clinical presentation of ulnar neuritis

Neuritis is an inflammation of the

Fig. 1. Physical therapy classes with a patient suffering from ulnar neuritis (https://medspina.ru/wp-content/uploads/lfk-pri-nevrite.jpg)

peripheral nerves, which often occurs as a result of traumatic injury, infectious and inflammatory processes, vitamin deficiency, intoxication and metabolic disorders[6].

There are many factors that can contribute to the emergence of neuritis of the elbow joint: the presence in the body of the causative agent of infectious diseases (herpes, typhoid, measles), the development of hypothermia; the occurrence of bruises or fractures, poisoning with mercury, arsenic or alcohol, the presence of diseases of internal organs, deficiency of vitamins or minerals in the body[8].

Often the cause of the progression of neuritis of the ulnar nerve is the prolonged presence of the arm in a bent position, the prolonged stay of a person in a damp and cold room. The main and most noticeable symptom of the manifestation of neuritis is pain, which is localized in the elbow joint, tingling, aching, dull in nature, often paroxysmal. In case of neuritis of the ulnar nerve, the victim may complain of complete or partial loss of sensitivity of the skin of the hand. These symptoms can occur at any stage of the disease. Neuritis of the elbow joint is also manifested by paresthesias and a decrease in the sensitivity of the palmar surface of the hand in the area of half of the 4th and the entire surface of the 5th finger with reddening of the skin on them[9].

The disease is characterized by weakness of the adductors and abductors of the 4th and 5th fingers. Gradually, hypotrophy or atrophy of the muscles of the entire hand can develop. As a result, the palm acquires a flat look, and the hand looks like a "clawed paw", since the joints on both sides of the middle finger phalanges are bent, and the rest are unbent. In addition, along the location of the ulnar nerve, it may be infringed in the musculoskeletal canals with the development of tunnel syndrome[10].

In the absence of competent therapy, the patient may develop trophic tissue disorders in the area of the damaged nerve. They are expressed in the form of blueness and swelling of the skin, excessive sweating, and sometimes in the appearance of ulcers[11].

Thus, ulnar nerve neuritis is a pathological condition caused by a lesion of a given nerve, in which disturbances of its sensory and motor functions are observed. Symptoms of the disease can be different and are associated with a disorder of the motor and sensory function of the limb, and sometimes trophism of its tissues.

Physical rehabilitation for neuritis of the ulnar nerve

An important means of rehabilitation of patients with peripheral nerve damage is therapeutic physical culture. In case of neuritis

Fig. 2. The episode of the massage effect for neuritis of the ulnar nerve (https://cdn.techtitute.com/cursosmedicina/media/curso/5240/banner/curso-dano-cerebral-adquirido-geriatria-medico-rehabilitador-portada.png)

of the ulnar nerve, it provides stimulation of regeneration and disinhibition of the whole nerve, improvement of blood supply and trophic processes in the lesion with the aim of preventing the formation of adhesions and cicatricial changes, prevention of contractures and stiffness in the joint, strengthening of paretic muscles and ligamentous apparatus, restoration of working capacity and normalization of motor functions[12](Figure 1).

Initial physical therapy classes are often held in water. A sick hand is dipped in water, and a healthy finger is taken from each finger and carefully lifted up. Then the fingers are spread apart, make circular movements with a sick brush. When the problematic arm begins to bend normally, you can gradually begin to use other movements. Modeling, drawing, and shifting fingers of beads, matches, and other small objects are useful here. A good exercise for developing your fingers would be to catch small objects from the water[13].

In addition to therapeutic physical culture, patients are advised to use occupational therapy during rehabilitation for ulnar neuritis. Its value in the rehabilitation of patients with pathology of the upper extremities is associated with the implementation of certain labor operations aimed at restoring the function of damaged nerves[14].

There is an opinion that physiotherapy and occupational therapy are mutually complementary. This is due to the fact that exercises in therapeutic gymnastics cannot fully reproduce the complex movements necessary to fulfill domestic and labor needs. At the same time, the use of occupational therapy in no way precludes the use of other means of physiotherapy, it only supplements them. The methods of physical therapy and occupational therapy are close and should always be combined. This combination is especially effective when performing massage procedures in the area of the passage of the inflamed nerve (Figure 2) [15].

In these patients, mechanotherapy is effective, which reduces joint stiffness, eliminates tissue swelling, and improves the reparative regeneration of damaged structures. The prescribed exercises are performed with minimal amplitude at a slow pace to avoid overloading the inflammatory nerve. The duration of the procedure in the first days of rehabilitation is 5-7 minutes, in the following days - it increases to 10-15 minutes, taking into account the improvement in well-being. At the same time, they seek to increase the duration and intensity of the procedures, as well as the amplitude of the movement to the limit. During the procedure, the sensation of only minor pain in the rehabilitated limb is allowed[16].

Physiotherapy is a recognized highly effective way to eliminate ulnar neuritis. Physiotherapy is indicated for the abatement of acute phenomena. With ulnar neuritis, electrophoresis is often performed with the simultaneous administration of novocaine and lidase, phonophoresis with hydrocortisone, magnetic therapy, acupuncture, ultra-high-frequency therapy, pulsed current treatment, applications with therapeutic mud. Sometimes electromyostimulation of muscle tissue of the upper extremities can be prescribed[17].

Physiotherapeutic procedures are also carried out in the form of transspinal exposure to a spinal cord and spinal roots at the level of entry of the roots involved in the formation of an inflamed nerve with a pulsed magnetic field. The impact is carried out by rhythmic pulses with a frequency of 3 Hz, with an intensity of 1.5-2 T, with a session duration of 5-7 minutes, for a course of treatment of 10-15 procedures[18].

Reflexotherapy can significantly accelerate the recovery of the upper limbs of the patient[19]. It is carried out daily or every other day, various combinations of corporal and auricular acupuncture are used. For some, according to indications in the rehabilitation course, craniopuncture, vacuum therapy, pharmacopuncture of combilipene, traumeel, 1% nicotinic acid can be used, irritation with a bunch of needles is carried out individually in various combinations with a 25% solution of dimexide with 1% thiamine chloride dissolved in it applied to the skin and 1% pyridoxine hydrochloride[20,21].

Thus, with the correct and timely diagnosis, it is possible to prescribe effective physical rehabilitation for ulnar neuritis, which, as a rule, ensures a favorable outcome. However, physical rehabilitation does not always contribute to a full recovery with this diagnosis. This fact requires further research on its improvement and development.

CONCLUSION

There are many factors that can contribute to the emergence of neuritis of the elbow joint: the presence of the causative agent of infectious diseases in the body, the development of hypothermia, the occurrence of bruises or fractures, poisoning with mercury, arsenic or alcohol, the presence of diseases of internal organs, a deficiency of vitamins or minerals in the body. The main and most noticeable symptom of the manifestation of neuritis is pain, which is localized in the elbow joint, tingling, aching, dull in nature, often paroxysmal. Despite the disclosure of many theoretical aspects of the physical rehabilitation of patients with ulnar nerve damage, there are still no clear views on the technique for correcting this neuropathy. The most often recommended complexes of physical rehabilitation for peripheral neuropathies are not always effective in terms of restoring the function of the ulnar nerve. Used standard sets of exercises for the hand and fingers are often not effective in these patients. In addition to medical physical culture, it is recommended to use occupational therapy during rehabilitation for ulnar neuritis. Its value in the rehabilitation of patients with pathology of the upper extremities is associated with the implementation of certain labor operations aimed at restoring the function of the damaged radial nerve. With neuritis of the ulnar nerve, mechanotherapy is also very effective, which reduces joint stiffness, eliminates swelling of tissues, and improves the reparative regeneration of damaged structures. Physiotherapy also proved to be a very effective way to eliminate ulnar neuritis. It is clear that with the correct and timely diagnosis, it is possible to begin rehabilitation earlier for ulnar neuritis, which very often provides a favorable outcome. However, any physical rehabilitation does not always contribute to a full recovery.

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